CLAIMS

1. Optical cable comprising at least one tubular element of polymeric material and at least one transmission element housed within said tubular element, wherein said polymeric material is made from a polymeric composition comprising:

(a) at least one olefin polymer;

(b) at least one inorganic filler;

(c) at least one olefin polymer including at least one functional group;

wherein said at least one olefin polymer including at least one functional group (c) is present in the polymeric composition in an amount of from about 3 parts by weight to about 10 parts by weight with respect to 100 parts by weight of the olefin polymer (a).

2. Optical cable according to claim 1, wherein said at least one olefin polymer including at least one functional group (c) is present in the polymeric composition in an amount of from about 5 parts by weight to about 8 parts by weight with respect to 100 parts by weight of the olefin polymer (a).

3. Optical cable according to claim 1 or 2, wherein said tubular element is a buffer tube housing said at least one transmission element.

4. Optical cable according to claim 3, wherein said buffer tube is defined by a peripheral wall having a thickness lower than about 0.5 mm.

5. Optical cable according to claim 4, wherein said buffer tube is defined by a peripheral wall having a thickness lower than about 0.2 mm.

6. Optical cable according to claim 5, wherein said buffer tube is defined by a peripheral wall having a

thickness down to about 0.1 mm.

7. Optical cable according to any one of the preceding claims, wherein said polymeric material has a ultimate tensile strength lower than about 12 MPa.

8. Optical cable according to claim 7, wherein said polymeric material has a ultimate tensile strength between about 5 MPa and about 10 MPa.

9. Optical cable according to any one of the preceding claims, wherein said polymeric material has an elongation at break lower than about 100%.

10. Optical cable according to claim 9, wherein said polymeric material has an elongation at break between about 30% and about 80%.

11. Optical cable according to any one of the preceding claims, wherein the olefin polymer (a) is selected from semi-crystalline or crystalline α-olefin polymers including homopolymers, copolymers, terpolymers, or mixtures thereof, containing one or more monomeric units.

12. Optical cable according to claim 11, wherein the α-olefins polymers contain from 2 to about 20 carbon atoms.

13. Optical cable according to claims 11 or 12, wherein the olefin polymer (a) is selected from: low density polyethylene (LDPE), high density polyethylene (HDPE), linear low density polyethylene (LLDPE), ultra low density polyethylene (ULDPE); polypropylene (including isotactic polypropylene); high and low density poly-1-butene; poly-4-methyl-1-pentene; ultra-low-molecular weight polyethylene; ethylene-based ionomers; poly-4-methyl-1-pentene; ethylene propylene copolymers; ethylene-propylene-diene copolymers (EPDM); copolymer of ethylene and/or propylene with other copolymerizable monomers such as ethylene-1-butylene copolymer, ethylene-vinyl acrylate copolymer, ethylene-methyl acrylate copolymer, ethylene-butyl acrylate

copolymer, ethylene-ethyl acetate copolymer, ethylene-vinyl acetate copolymer, propylene-4-methyl-1-pentene copolymer, ethylene-vinyl alcohol copolymer; ethylene acrylic elastomers such as ethylene-methyl acrylate-acrylic acid terpolymers; or mixtures thereof.

14. Optical cable according to any one of the preceding claims, wherein the inorganic filler (b) is selected from: hydroxides, hydrated oxides, salts or hydrated salts of metals, or mixtures thereof.

15. Optical cable according to claim 14, wherein the inorganic filler (b) is selected from: magnesium hydroxide, aluminium hydroxide, aluminum oxide, alumina trihydrate, magnesium carbonate hydrate, magnesium carbonate, magnesium calcium carbonate hydrate, magnesium calcium carbonate, or mixtures thereof.

16. Optical cable according to claims 14 or 15, wherein the inorganic filler (b) is in the form of coated particles.

17. Optical cable according to claim 16, wherein the inorganic filler (b) is coated with saturated or unsaturated fatty acids containing from 8 to 24 carbon atoms, or metal salts thereof.

18. Optical cable according to any one of claims 14 to 17, wherein the inorganic filler (b) is present in the polymeric composition in an amount of from about 40 parts by weight to about 200 parts by weight with respect to 100 parts by weight of the olefin polymer (a).

19. Optical cable according to claim 18, wherein the inorganic filler (b) is present in the polymeric composition in an amount of from about 75 parts by weight to about 150 parts by weight with respect to 100 parts by weight of the olefin polymer (a).

20. Optical cable according to any one of the preceding

claims, wherein the olefin polymer including at least one functional group (c) is selected from:

(c_1) at least one terpolymer of at least one α-olefin, at least one acrylic acid ester, and at least one α,β-olefinically unsaturated dicarboxylic acid reagent or its derivatives such as anhydrides, metal salts, imides, esters, or at least one glycidyl acrylate;

(c_2) at least one terpolymer of ethylene, at least one α,β-olefinically unsaturated dicarboxylic acid anhydride, and at least one vinyl ester of a saturated carboxylic acid;

(c_3) at least one olefin polymer grafted with at least one ethylenically unsaturated monomer.

21. Optical cable according to claim 20, wherein the terpolymer (c_1) comprises from about 50% by weight to about 99% by weight of at least one α-olefin, from about 0.5% by weight to about 40% by weight of at least one acrylic acid ester, and from about 0.3% by weight to about 10% by weight of at least one dicarboxylic acid reagent, or of at least one glycidyl acrylate.

22. Optical cable according to claim 20 or 21, wherein in the terpolymer (c_1) the α-olefin is selected from α-olefins containing from 2 to about 20 carbon atoms.

23. Optical cable according to any one of claims 20 to 22, wherein in the terpolymer (c_1) the acrylic acid esters is selected from compounds having the following formula:

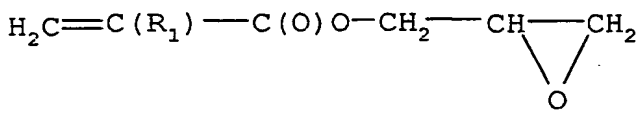
$$CH_2=C(R)COOR'$$

wherein R represents hydrogen, or a lower alkyl group containing from 1 to 4 carbon atoms such as methyl or ethyl, and R' represents a lower alkyl group having from 1 to 6 carbon atoms.

24. Optical cable according to any one of claims 20 to 23,

wherein in the terpolymer (c_1) the α,β-olefinically unsaturated dicarboxylic acid reagent or its derivatives is selected from: maleic acid, maleic anhydride, fumaric acid, mesaconic acid, itaconic acid, citraconic acid, itaconic anhydride, citraconic anhydride, monomethyl maleate, monosodium maleate, or mixtures thereof.

25. Optical cable according to any one of claims 20 to 24, wherein in the terpolymer (c_1) the glycidyl acrylate is selected from compounds having the following formula:



wherein R_1 represents hydrogen or a lower alkyl group containing fro 1 to 6 carbon atoms.

26. Optical cable according to any one of claims 20 to 25, wherein the terpolymer (c_1) is selected from: ethylene-methyl acrylate-maleic anhydride, ethylene-ethyl acrylate-maleic anhydride, ethylene-butyl acrylate-maleic anhydride, propylene-methyl acrylate-maleic anhydride, propylene-ethyl acrylate-maleic anhydride, ethylene-methyl acrylate-glycidyl methacrylate, ethylene-methyl acrylate-glycidyl acrylate, or mixtures thereof.

27. Optical cable according to claim 20, wherein in the terpolymer (c_2) the α,β-olefinically unsaturated dicarboxylic acid anhydrides is selected from: citraconic anhydride, itaconic anhydride, tetrahydrophthalic anhydride, maleic anhydride, or mixture thereof.

28. Optical cable according to claim 20, wherein in the terpolymer (c_2) the vinyl ester of a saturated carboxylic acid is selected from vinyl ester of a saturated carboxylic acid containing from 2 to 6 carbon atoms.

29. Optical cable according to claims 27 or 28 wherein the terpolymer (c_2) is ethylene-vinyl acetate-maleic anhydride.

30. Optical cable according to claim 20, wherein in the olefin polymer grafted with at least one ethylenically unsaturated monomer (c_3) the olefin polymer is selected from: homopolymers of ethylene; homopolymers of propylene; copolymers of ethylene and propylene; terpolymers of ethylene, propylene and dienes (EPDM); copolymers of ethylene with at least one C_3-C_{10} hydrocarbon α-olefin; copolymers of ethylene and vinyl acetate, alkyl acrylate or alkyl methacrylate.

31. Optical cable according to claim 30, wherein the ethylenically unsaturated monomer is selected from ethylenically unsaturated carboxylic acids or derivatives thereof, ethylenically unsaturated carboxylic acid anhydrides, or mixture thereof.

32. Optical cable according to claim 31, wherein the carboxylic acids are: acrylic acid, methacrylic acid, maleic acid, fumaric acid, itaconic acid, crotonic acid, or mixtures thereof.

33. Optical cable according to claim 31, wherein the anhydrides are: itaconic anhydride, maleic anhydride, substituted maleic anhydride, nadic methyl anhydride, tetrahydrophthalic anhydride, or mixture thereof.

34. Optical cable according to claim 31, wherein the unsaturated carboxylic acid derivatives are: salts, amides, imides or esters such as, mono- and disodium maleate, acrylamide, maleimide, glycidyl methacrylate, dimethyl fumarate, or mixture thereof.